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WORK PLAN OUTLINE
BASELINE EVALUATION
CIRCLE WEST PROJECT OF DREYER BROTHERS, INC.
MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
ENERGY PLANNING DIVISION

STATE DOCUMENTS COLLECTION

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I. INTRODUCTION

A. The purpose of this work plan outline.

1. Develop a common understanding of the staff effort necessary to design the baseline evaluation for the Circle West proposal of Dreyer Brothers, Inc.

2. Set forth the performance standards and procedures to be utilized in developing the overall study.

3. Outline the actual work that must be accomplished in order to initiate the study.

B. The baseline studies will be funded by Dreyer Brothers, Inc. pursuant to a contract with the Department which was made in accordance with the Major Facility Siting Act. Although information derived from the studies will be made available to Dreyer Brothers, Inc. and others, the Department is responsible to the people of the state. Consequently, the study will reflect this fact, and be conducted in manner that is consistent with our various statutory obligations.

C. Governor Judge has designated the Department as the lead agency for any state actions that may be taken upon the proposal. As such, we will be expected to coordinate our activities with all state agencies involved in the Dreyer Brothers proposal. We intend to develop a plan of study that will permit acquiring sufficient information for all state agency needs. Finally, in the event an application is received from Dreyer Brothers for the Circle West Project, we plan to continue coordinating state agency action and develop a joint environmental impact statement.

D. The contract with Dreyer Brothers, Inc. calls for coordinating our actions with all levels of government and interested parties. Information resulting from the studies will be made available to all parties concerned for preparing any environmental impact statements. Similar to our situation with the state agencies, it is incumbent upon the Department to coordinate our activities with the various federal agencies involved in the action. If at all possible, and in the event Dreyer Brothers decides to proceed with the action, we will attempt to develop a joint federal-state environmental impact statement upon the project.

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II. OBJECTIVES

A. Develop and conduct a cross-disciplinary baseline study that is consonant with the Major Facilities Siting Act and the Montana Environmental Policy Act, and will permit initiation of impact evaluations if a facility application is received.

B. Obtain data that are acceptable to those local, state and federal agencies with an involvement in the proposed project and is suitable for their assessment of the action under applicable statutes.

C. Acquire definitive human and natural resource data that will satisfy the planning requirements of Dreyer Brothers, Inc. as well as various local, state and federal agencies.

III. BACKGROUND CONSIDERATIONS

A. The studies which will be made at this time are for the purpose of acquiring the baseline data necessary to evaluate the Dreyer Brothers Circle West proposal under the Major Facility Siting Act and the Montana Environmental Policy Act (if an application is received).

B. In developing the study design utilize process data from the Engineering Feasibility Study for the Circle West project. These data will be updated with engineering consultant evaluations, new data from Dreyer Brothers and department studies.

C. For purposes of designing the baseline study program it will be necessary to rely upon project, process and site information provided the Department by Dreyer Brothers:

1. The Dreyer Brothers ranch in McCone County is proposed as the primary plant site.

2. The coal, necessary for the various processes, will be mined from Dreyer Brothers' land. Although the development could proceed with fee coal only, the ultimate possibility of including contiguous federal coal exists. An application for these federal coal resources has been made to the Bureau of Land Management by Dreyer Brothers.

3. A site between Ft. Peck Dam and Oswego (utilizing water from the Missouri River and coal from the Dreyer Ranch) is proposed as a possible secondary plant location.

4. Dreyer Brothers, Inc. is in the process of developing the criteria for evaluating alternative sites and will conduct the necessary studies. We will monitor this effort and adjust our studies as new information becomes available.

5. Dreyer Brothers has informed the Department that the Circle West facility will involve the production of either ammonia <u>or</u> methanol. If an application is received under the Siting Act, we can expect, that at least in the short-run, it will be for only one of these processes.

6. Although the first application may be for only one coal-conversion process, we should anticipate the possibility of a plant expansion at a future date. Therefore, design the studies to reflect the ultimate possibility of all three processes being at the site (e.g., ammonia, methanol, and diesel fuel).

D. In developing the study design, assume worst probable case conditions until final process and size information are available.

E. The outline of baseline study parameters (Appendix A) may be used as a point-of-departure for the ultimate study design. However, at the outset of the study design process, we need not constrain our thoughts by the study parameter checklist.

F. Wherever possible, incorporate existing data and research programs into the study design.

G. Focus study (especially at the beginning) upon those baseline parameters with the greatest predictive value and capability of phasing into an impact determation study if an application is received pursuant to the Siting Act.

H. Develop studies only as available process information will allow. Where possible, develop capability to revise (expand/decrease) the nature and scope of studies. It is likely that the initial studies will be reconnaissance in nature and the overall study will be conducted in phases. If this is the case, the design should address both phases with more detail evident in the initial effort.

I. Design the studies to reflect our statutory responsibility of monitoring a facility which has received a certificate under the Siting Act. This includes permanent photo points, study plots or data gathering stations. Since there is uncertainty about the process and probable impacts, it is likely that certain monitoring facilities will be involved in later phases of the baseline study.

J. Since plant cost and thus any ultimate filing fee are indeterminate, avoid premature initiation of field work or studies of a "nice-to-know" nature. We must justify the overall rationale for the study design in light of the unknowns.

K. As a minimum, and where applicable, four-season studies will be conducted.

L. In accordance with the contract, we are expected to designate a project area for the study. The study design will likely require the delineation of study areas that vary in size and shape (depending upon the study parameters involved). Further, the size and shape may be refined as new process and resource information is developed.

At the outset of the study, however, it may be more appropriate to not limit the evaluation to an absolute defineable area. Obviously the studies should have spatial limits. Therefore, given the various objective of each study, we could define the study area as that which is necessary to describe the biotic and abiotic attributes of an area that may be influenced by a mine and coal-conversion facility located within McCone County and near Fort Peck Reservoir or the Missouri River. Once the reconnaissance-level studies are replete and we gain a better understanding of the plant design and meteorological conditions of the area, we can refine a project area description. Ultimately, our most important consideration is to carefully define an impact area in which to focus any subsequent impact studies. This approach to the project study should be carefully considered. If we do otherwise, we may limit our evaluations by arbitrarily not including certain key areas within the project area. Additionally, if a definable project area exists there may be a tendancy to study every portion of the area, regardless of its significance to the project.

M. Consult with involved federal and state agencies (see Appendix B), and utilize acknowledged experts in developing the study design and estimated budgets. The final plans of study must receive a critique from these groups and individuals and, where appropriate, be changed to reflect this input.

N. Consider the possibility of conducting an evaluation of the mine site (pursuant to the mine siting and reclamation laws) as an adjunct to Major Facility Siting evaluations.

IV. WORK OUTLINE

A. General considerations relating to the conduct of work.

1. Similar to any research program, the staff will first develop a joint problem analysis. Subsequently, a complete, interactive plan of study will be developed for the baseline evaluation.

2. Staff members will be assigned as coordinators for the major subject components and responsible for:

   a. Developing the necessary plan of study.

   b. Interfacing with the other study components both during the plan development phase and the actual evaluation.

3. The overall study will be divided into the following subject components:

   a. Physical environmental analysis

      (i) meteorology

      (ii) geology/soils

      (iii) water resources

   b. Biological analysis

      (i) vegetation

      (ii) terrestrial fauna

      (iii) aquatic fauna

   C. Economic/social analysis

      (i) demography/social/political legal

      (ii) economic

      (iii) land-water use/historical-cultural values

   d. Engineering analysis

B. Problem Analysis

1. As a precursor to preparing the actual plan of study, develop a problem analysis for each study component and articulate study objectives in light of the background information in Section III. Justify study emphasis in consideration of the presently-known project information and resource data.

2. Determine project/process informational needs.

3. Establish informational needs from other study components where necessary to design or initiate all, or a portion, of a study.

4. Determine in-house capabilities and establish where contractor assistance is necessary.

5. Outline a general time schedule and preliminary budgetory requirements. Porposed budgets should be somewhat in accord with the overall study budget shown in Appendix C. The necessity of deviating from the overall budget must be substantiated by the problem analysis.

C. Plan of study

1. An overall time schedule for the entire baseline evaluation will be prepared on the basis of each problem analysis. The general components of the schedule will include time periods for:

   a. Study design/staff acquisition.

   b. Proposal(s) circulation/due.

   c. Negotiations.

   d. Subject area studies (including sub-studies).

   e. Final report.

2. An overall budget for the entire baseline evaluation will be prepared on the basis of each problem analysis.

   a. Once agreed upon, each study plan budget must be in accord with the overall budget.

   b. It is expected that the overall program budget will be substantially similar to that shown in Appendix C.

3. On the basis of an approved problem analysis and in accordance with the overall time schedules and budget, develop a detailed plan of study for each study component. Use a common format in setting out the plan of study and include:

   a. A statement of the study objectives.

b. A general discussion of the study, including underlying assumptions, general expectations from the study, and the manner in which the study will interface with the overall baseline evaluation.

c. Point out existing data and research that is relevant to the study.

d. Outline the scope of work.

e. List the completion dates for interim, draft and final reports; meetings; briefings.

f. Estimated the cost of the study. A detailed budget breakdown is expected.

g. Point out when and where interaction with other study components is expected.

4. Where contractor support is necessary, prepare requests for proposals (RFP). It is likely that the RFP can be integrated into the overall plan of study for each study component.

D. Establish cooperative agreements with state/federal agencies involved in Dreyer Brothers proposal.

1. Agree on study format/content.

2. Agree to share data.

3. Participate in studies -- manpower/funding.

4. Develop procedures for developing a joint federal/state environmental impact statement.

E. Attempt to develop parallel baseline studies in the Glasgow area as a component of Coal Gasification Task Force effort.

F. Establish criteria for costs which may be credited against any filing fee if an application is received pursuant to the Major Facility Siting Act.

G. Finalize exhibits to DNR-Dreyer Brother contract.

2. Air Quality

a. Wind speed and direction

b. Mixing depth; inversion frequency, duration, timing

c. Plume dispersal

d. Fugitive dust

e. Visibility

(1) Gaseous substances (NO_x)

(2) Particulate matter

(3) Aerosols

(a) Mass and size distribution

(b) Refractive Index

(c) Particle shape and physical structure

f. Ambient air characterization (Annual; 24 hour; 3 hour; 1 hour)

(1) Particulate matter

(a) Total mass loading

(b) Size distribution

(c) Chemical content analysis

(2) Sulfur dioxide

(3) Nitrogen oxides

(4) Hydrocarbons

(5) Total sulfur

(6) Hydrogen sulfide

(7) Sulfates

(8) Hydrogen cyanide

(9) Hydrogen chloride/hydrochloric acid

(10) Ammonia

(11) Fluorides

(12) Ozone

(13) Radionuclides

APPENDIX ONE
BASELINE DATA ANALYSES
BURLINGTON NORTHERN INDUSTRIAL DEVELOPMENT PROPOSAL
MCCONE COUNTY, MONTANA

I. PHYSICAL ENVIRONMENT

A. AIR

1. Climate (Compiled from existing data sources, where possible)

a. Precipitation

(1) Average

(2) Maximum

(3) Minimum

(4) Periodic precipitation

(5) Snowfall characteristics/quantities

b. Temperature

(1) Average

(2) Maximum--yearly and seasonal

(3) Minimum--yearly and seasonal

c. Wind

(1) Direction

(2) Speed

(3) Maximum speed

(4) Periods of prolonged calm winds

d. Evaporation

e. Air mass behavior by season

f. Humidity--maximum/minimum

g. Climatic history (wet/dry cycles, etc.)

(4) Trace element determination

(5) Petrographic studies

b. Non-metallic mineral resources

c. Oil and gas resources

6. Unique geologic features

C. SOILS

1. General soil analysis (Overall study area)

a. Soil series classification (To 5 foot depth)

2. Mining area soil analysis (surface 5 feet/overburden)

a. Profile descriptions

(1) Pedon description

(2) Permeability

(3) Depth to bedrock

(4) Horizon analysis

(a) Structure

(b) Texture

(c) pH

(d) Coarse fragments

(e) Water holding capacity

(f) Organic matter

(g) Sodium absorption ratio

(h) Soluble and exchangable cations; soluble anions

(i) Conductivity

(j) Macronutrients/trace minerals

b. Identification impervious layers

c. Present condition class

d. Special physical features

g. Precipitation

(1) pH

(2) Nutrient concentration

(3) Trace elements

h. Existing emission sources

(1) Location

(2) Substance(s) emitted

(3) Areal influence

B. GEOLOGY

1. Physiography

a. Land form features and associations

2. Stratigraphy

a. Description of exposed rock units

b. Glacial deposits

c. Detailed mapping/stratigraphic description (mining area)

3. Structure

a. Elements influencing groundwater flow patterns

b. Folds/faults

4. Seismicity

5. Economic Geology (Focus upon coal within area to be mined)

a. Coal

(1) Reserve estimate

(a) Total

(b) Strippable

(c) Number of seams

(d) Depth of seams--core analysis

(2) Proximate analysis and BTU content

(3) Ultimate analysis

(1) Volume

(2) Depth and bottom characteristics

(3) Sedimentation (including chemical analysis for iron, manganese, sulphate, etc.)

(4) Surface fluctuation

(5) Inflow-outflow (Amounts as function of time)

(6) Complete water quality assessment (entire water column)

(7) Biological productivity--fish, primary/intermediate producers. (To be coordinated with other biological studies)

(8) Thermal stratification formation/breakup

(9) Seasonal variation in all chemical and physical parameters--entire water column

b. Streams

(1) Flow data on important streams

(a) Rates

(aa) Annual

(bb) Maximum and minimum

(cc) As related to seasonal long-term changes

(2) Precipitation - Runoff (To be coordinated with meteorology and rangeland studies)

(3) Water Quality (Standard parameters and related to flow)

(4) Floodplain mapping and evaluation--permanent/ephemeral streams and coulees/washes (To be coordinated with biological studies)

2. Ground Water

a. Identify aquifers and groundwater systems

(1) Local systems

(a) Near proposed mining areas

(b) Near plant sites, town sites, etc.

(c) Flow patterns and well yield

(1) Rock outcroppings

(2) Clay buttes

(3) Scoria knobs

(4) Saline or alkali seeped spots

(5) Other

3. Soil interpretations

a. Erodibility

b. Frost potential

c. Impervious surfaces

d. Load-bearing strength, road stability

e. Predicted yield (irrigated/non-irrigated crops)

f. Sand, gravel suitability

4. Existing/potential irrigation

a. Land classification

(1) Correlation of Soil Surveys into land classification considering:

(a) Topography

(b) Soil-depth, texture, structure, salinity, permeability and parent material

(c) Drainage

(aa) Surface drainage

(bb) Subsurface--depth and kind of barrier

(cc) Chemical characteristics below 5 feet

(d) Selected crop productivity by soil series or associations

(e) Yield by plant community by range site

D. WATER RESOURCES

1. Surface water

a. Fort Peck Reservoir

a. Condition and trend

b. Above ground production and utilization (current/potential)

c. Noxious and poisonous plants

d. Obvious limiting factors

(1) Disease

(2) Insects

(3) Other

3. Chemical baseline determination

a. Tissue analysis

(1) Fluorides

(2) Sulfur

(3) Heavy metals

(4) Other

b. Vegetational sensitivity to possible phytotoxins

4. Wildlife, domestic animal utilization (Correlated with faunal analysis)

a. Current use levels (by season)

b. Forage potential

c. Shelter/cover capabilities

B. FAUNAL ANALYSIS (Terrestrial/aquatic)

1. Survey of species present (game/non-game)

a. Occurrence and relative abundance, and seasonal distribution

b. General location of use areas by season

c. General habitat requirements for each species

d. Food chain interrelationships

2. Game species and other major species (sagegrouse, sharp-tailed grouse, pheasant, deer, antelope, furbearers, predators)

(d) Groundwater quality data

(e) Recharge and discharge areas

(2) Regional systems

(a) Flow patterns

(b) Groundwater data

(c) Well yield

(d) Recharge and discharge areas

b. Identify area where high water table could create engineering or geological hazards

II. BIOLOGICAL ENVIRONMENT

A. VEGETATIONAL ANALYSIS (Terrestrial/aquatic)

1. Vegetation inventory

a. Community type descriptions

(1) Frequency

(2) Cover

(3) Cluster analysis

(4) Ordination

b. Relic plant communities

c. Rare and endangered populations/species/communities

d. Successional stages (Narrative description, if known)

e. Community/species autecological relationships

(1) Topography

(2) Soils

(3) Slope

(4) Aspect

(5) Total plant cover (Implied by type and density)

(6) Climate

2. Range resource analysis

4. Bioassays - trace elements (deer, vole, pocket gophers, ground squirrels as well as non-primary consumer species)

5. Economic and aesthetic importance (game/non-game)

III. ECONOMIC ENVIRONMENT (Define symbiosis, provide comparisons of [illegible] with the state or portions of the state)

A. DEMOGRAPHY

1. Present population by ethnic group

   a. Age

   b. Education

   c. Marital Status

      (1) Divorce rate

      (2) Marriage age

      (3) Percent

   d. Fertility

   e. Mobility (in- and out-migration)

      (1) Origin of in-migrants

      (2) Reasons for migration

      (3) Skill/educational level of in- and out-migrants.

   f. Other (sex, poverty, etc.)

2. Population distribution and settlement patterns

3. Population/demographic trends

   a. Historical review

   b. Present outlook

B. ECONOMIC (Evaluation of the area's present economy with greatest emphasis on agriculture--the bulwark of the economic base.)

1. Employment and labor force

   a. By occupational group

   b. By industrial (SIC) group

   c. Labor force structure/availability including seasonal patterns

   a. Population analysis

      (1) Density (numbers/unit area)

      (2) Sex ratio

      (3) Size and trends

      (4) Age structure

      (5) Productivity

      (6) Mortality (natural/man-caused)

      (7) Range and distribution

   b. Habitat survey

      (1) Assessment of habitat types

      (2) Season or reasons of use by each species

      (3) Critical use areas

         (a) Seasonal concentration areas

         (b) Fawning or calving areas

         (c) Nesting or brooding areas

         (d) Special or critical use areas (i.e. dancing grounds, cover)

         (e) Migration routes

      (4) Current use levels

         (a) Criteria for species habitat

   c. Recreational significance

      (1) Hunter pressure and success

      (2) Season

      (3) Landowner conflicts, etc.

   d. Regulatory controls

3. Endangered and threatened species

   a. Inventory--including migration/movement patterns

   b. Habitat requirements including breeding/rearing areas

   c. Population trends

(1) New crops

(2) New livestock activities (breeds, practices, etc.)

(3) New marketing or purchasing patterns

k. Farm depts, taxes, income distribution and disposition

l. General discussion of county agriculture (Tenant farmers, part-time operators, purchasing and marketing patterns, etc.)

m. Any discernable trends for parameters a-f and the general outlook for area's agriculture.

5. Wholesale and retail trade

a. Local sales

b. Source of inventory

c. Trading patterns

6. Government -- state, local, tribal, Federal

7. Energy exploration and production

8. Tax base and revenues

9. Private finance

a. Local institutions

b. Patterns of finance

c. Availability of finance

10. Capital stocks

a. Productive capital

b. Inventories

11. General discussion and summary of apparent trends, including a discussion of the outlook for the economy in the absence of any coal-based activity.

C. SOCIAL CONDITIONS

1. Social Services (including assessment of excess capacity and where applicable, reasons for needs)

a. Health care

d. Trends

e. Unemployment

(1) Percentage

(2) Number

(3) Skill/educational level

f. Multiplier determination

2. Income

a. Current and historical

b. Distribution

c. Trends/stability

d. Multiplier determination

e. Sources

3. Earnings

a. By occupational group

b. By industrial group

4. Agriculture

a. Farms (Number, size, ownership, etc.)

b. Crops (Listing, acres, yields, value)

c. Livestock (Numbers on farms, sales, value of sales)

d. Summary and analysis of county agricultural data (Agricultural statistics, census of agriculture)

e. Farm income (Receipts from sales, government payments, etc.)

f. Irrigation (Discuss the extent of irrigation in the county; include some case studies of irrigation successes and/or failures)

g. Profile of a "typical" dryland grain operation

h. Profile of a "typical" livestock operation

i. Profile of a "typical" diversified farm operation

j. Recent developments in area's agriculture

(3) Facilities and equipment - type, number, and capacity

e. Law enforcement services

(1) Number and forms of organization

(2) Service personnel (training)

(3) Facilities and equipment - type, number, and capacity

f. Transportation

(1) Highways, secondary roads

(a) Traffic flow - number of vehicles and direction

(b) Road condition

(c) Maintenance and repair

(2) Railroads

(a) Availability of freight and passenger service

(3) Other forms of public transportation

(a) Bus - schedules, routes, boardings, stations

(b) Airline - schedules, routes, boardings, stations

g. Water

(1) Supply, distribution, treatment and storage facilities

(2) Usage rates

(3) Operation and maintenance

h. Sanitation

(1) Sewers (sanitary and storm) - collection and treatment facilities

(2) Solid refuse - collection and treatment facilities

(3) Operation and maintenance

(1) Numbers and types of health care personnel (e.g. MD's, RN's, Lab. Techs, etc.)

(2) Health care facilities

(a) Hospitals - bed capacity, age of facilities, services available, funding

(b) Ambulance - type of equipment, age of equipment, operators, funding

(c) Retirement/Nursing Homes - bed capacity, age, funding

(d) Mental Health Facilities - type of services, frequency, funding

(e) First Aid - availability of service, etc.

b. Welfare services

(1) County welfare programs - type, number enrolled, personnel, facilities, funding

(2) Youth services - type, number enrolled, personnel, facilities, funding

(3) Services for the elderly - type, number enrolled, personnel, facilities, funding

(4) Counseling services - type, number enrolled, personnel, facilities, funding

c. Educational services

(1) Service personnel - number, types (music teachers, etc.)

(2) Educational facilities - capacity, enrollments, instructional equipment

(3) Educational programs

(a) Children, adult, extension services

(b) Relationship to possible skills needed on proposed project

d. Fire Protection

(1) Number and forms of organization - municipal district, county, etc.

(2) Service personnel (training)

D. POLITICAL/LEGAL SITUATION

1. Local, county, tribal and state government

   a. Structure

   b. Modes of operation

2. Evaluation of significant statues (All levels) relating to development

   a. Land

   b. Water

   c. Mineral

   d. Land use

   e. Relationships among governmental units

E. LAND USE

1. Ownership patterns (surface/subsurface)

   a. Small private

   b. Large private

   c. Railroad

   d. Public

      (1) City/County

      (2) State

      (3) Federal

   e. Tribal and alloted lands

2. Uses -- Current/projected

   a. Agricultural

      (1) Crops -- dryland/irrigated

      (2) Grazing

   b. Municipal

   c. Industrial

   d. Utility corridors

   e. Transportation

   i. Recreation

      (1) Formally organized programs - indoor and outdoor

      (2) Unorganized recreation - indoor and outdoor

      (3) Social clubs, fraternal organization, etc.

   j. Religion - Churches

      (1) Number and type

      (2) Affiliated programs, clubs, organizations, etc.

   k. Commercial and professional services

      (1) Number and types

      (2) Size, ownership, etc.

   l. Housing

      (1) Availability, rental, purchased, constructed

      (2) Condition

      (3) Cost, rental, purchased, constructed

2. Ethnographic - Life style analysis

   a. Social organization

      (1) Regional subcultures

      (2) Community subcultures

      (3) Group subcultures

   b. Social problems analysis

      (1) Deviant behavior, etc.

f. Recreation

g. Dedicated use areas

(1) Research natural areas (actual and potential)

(2) Game refuges

(3) Wild, Scenic and Recreational Waterways

(4) Indian reservations

(5) Wilderness

F. WATER USE

1. Allocation

a. Water rights (State, Federal, Tribal)

b. Water use description (Ground/surface)

(1) Diversion/transmission facilities

(2) Return flows

(3) Consumptive uses -- seasonally/annually

c. Instream uses

(1) Quantities legally reserved for public benefit (fisheries, wild and scenic rivers)

(2) Recreational reservations

(3) Navigation

2. Water Requirements

a. Existing and projected uses

(1) Municipal

(2) Industrial

(3) Irrigation agriculture

(4) Hydroelectric power

(5) Water-based recreation

(6) Fish and wildlife

(7) Water quality control

(8) Aesthetics

(9) Stockwater

(10) Navigation

b. Quantity/Quality Requirements

c. Existing or anticipated conflicts

(1) Competition for available supplies

(2) Water quality degradation

(3) Incompatible timing

(4) Interference among ground water users (contamination, excessive drawdown)

3. Effluent quality

a. Chemical/Biological

b. Thermal

c. Physical

4. Irrigation Use

a. Runoff quality

b. Soil problems (Stability, salinity)

c. Water table influence

5. Water Supply structures

a. Locations and areas involved

b. Proposed development plans

G. HISTORICAL AND CULTURAL VALUES

1. A history of the study area

2. Geologic features

3. Paleontological analyses

4. Archeological studies

5. Historical features

6. Recreational

E. MATERIAL FLOW DIAGRAMS

1. Plant water analysis
2. Plant air analysis
3. Plant coal conversion analysis
4. Plant chemical analysis

F. ENGINEERING AND OPERATING CAPACITIES

G. ENGINEERING STUDY OF POTENTIAL ALTERATIVE SOURCES
(Various gasification processes)

H. ENGINEERING STUDY OF POTENTIAL ALTERNATIVE TECHNOLOGIES

1. Heat reduction (cooling)
2. Air pollution controls
3. Fluidized - bed combustion for steam and power generation
4. Solid and liquid waste disposal

7. Aesthetic qualities
   a. Visual
   b. Adudible
      (1) Man-induced
      (2) Natural

IV. PRELIMINARY ENGINEERING ANALYSES

A. ENGINEERING ASSESSMENT OF AVAILABLE DATA AND DESIGN INFORMATION

B. SUMMARY OF THE PROJECT AND GENERAL SITE DESCRIPTION

1. Construction methods
2. Construction schedules and crew size

C. DESIGN CRITERIA AND FUNCTIONS OF MAJOR PLANT COMPONENTS

1. Coal preparation
2. Gasifier
3. H_2S/COS removal
4. CO converter
5. CO_2 removal
6. Liquid N_2 washer
7. Ammonia synthesis
8. Steam boiler plant
9. Air separation plant
10. Cooling water plant
11. Feedwater treatment plant
12. Emission control systems
13. Ash and/or sludge disposal

APPENDIX B

AGENCIES WITH A POTENTIAL INVOLVEMENT OR INTEREST IN THE CIRCLE WEST PROPOSAL

STATE

1. Department of Community Affairs
2. Department of Fish and Game
3. Department of Health and Environmental Sciences
4. Department of Highways
5. Department of Public Service Regulation
6. Department of State Lands
7. Montana Energy Advisory Council
8. Montana Coal Gasification Task Force

FEDERAL

1. Bureau of Indian Affairs
2. Forest Service
3. Corps of Engineers
4. Bureau of Land Management
5. Bureau of Reclamation
6. Old West Regional Commission
7. Fish and Wildlife Service
8. Soil Conservation Service
9. Geological Survey
10. Environmental Protection Agency

APPENDIX C

TENTATIVE BUDGET FOR CONDUCTING
BASELINE STUDIES

STUDY COMPONENT	EXPENSE
1. Meteorology	$75,000
2. Geology/soils	20,000
3. Water resources	25,000
4. Vegetation	30,000
5. Wildlife	30,000
6. Social	30,000
7. Economic	20,000
8. Land use	15,000
9. Engineering	15,000
10. Administrative	30,000

Sub-total		$290,000
Indirect cost (@10%)	$29,000	
Total		$319,000